

WHAT IS CLAIMED IS:

1. A beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising:
 - a filling machine being configured to fill empty bottles with liquid beverage filling material;
 - a conveyer arrangement being configured and disposed to move empty bottles to said filling machine;
 - said filling machine comprising a rotor having a peripheral portion;
 - said filling machine defining a vertical axis about which said rotor is configured to rotate;
 - said beverage filling machine comprising a plurality of beverage filling positions disposed about said peripheral portion of said rotor;
 - each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material;
 - each filling device comprising apparatus being configured to introduce a predetermined volume of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material;
 - said apparatus being configured to introduce a predetermined volume of liquid beverage filling material comprising apparatus being configured to terminate the filling of beverage bottles upon liquid beverage filling material reaching said substantially predetermined level in bottles;
 - each filling position comprising a support configured and disposed to maintain a bottle in a predetermined position for filling a by a corresponding filling device;

each filling position comprising an arrangement to seal a bottle for filling a bottle with an effervescent beverage;

apparatus being configured to raise and to lower said bottle support and a bottle supported thereby;

said lifting apparatus being configured to raise and lower said bottle support comprising:

- a rod having an exterior, a first, lower, end and a second, upper, end remote from said lower end;

- said lower end of said rod being secured to said rotor of said filling machine;

- a cylinder having a longitudinal axis and having an outer wall and an inner wall disposed about the longitudinal cylinder axis and forming a cylinder interior;

- said inner cylinder wall being configured and disposed to slide about said rod to permit up-and-down movement of said cylinder about said rod;

- said cylinder having a first, upper, end and a second, lower, end remote from said upper end of said cylinder;

- said bottle support being secured to said upper end of said cylinder to permit raising and lowering of said bottle support and a bottle supported thereby;

- a collar secured to said lower end of said cylinder;

- a first, upper, stop structure secured to said rotor of said filling machine adjacent said upper end of said rod;

- said cylinder outer wall being configured to slide within said upper stop structure;

- a second, lower, stop structure operatively connected to

said upper stop structure and being configured and disposed to slide on said outer cylinder wall;

a spring disposed between said upper stop structure and said lower stop structure and being configured to be compressed between said upper stop structure and said lower stop structure;

said rod comprising at least one first longitudinal passage configured to permit passage of a pressure medium from said lower end of said rod into said cylinder;

said cylinder being configured to be raised by a first, lower, pressure of a pressure medium passing through said first longitudinal passage of said rod and thus raising said bottle support and a bottle supported thereby to a first, lower, position being a position in which a bottle is disposed remote from said seal arrangement which lower position is configured for filling of a bottle with a still beverage;

said cylinder being configured to be raised by a second pressure, being a pressure higher than the first pressure, of a pressure medium passing through said first longitudinal passage of said rod and thus raising said bottle support and a bottle supported thereby to a second, higher, position being a position in which a bottle is sealed to said sealing arrangement which higher position is configured for filling of a bottle with an effervescent beverage;

said collar being configured to be disposed against said lower stop structure to maintain said bottle support and a bottle supported thereby in the lower position upon the lower pressure being applied in said cylinder;

said spring being configured and disposed to be compressed between said upper stop structure and said lower stop structure by said collar upon the higher pressure being applied in said cylinder to permit raising of said bottle support and a bottle supported thereby to the higher position; and

a seal arrangement disposed about said rod and being configured to sealingly engage said inner wall of said cylinder;

said rod comprising at least one second longitudinal passage disposed adjacent said first longitudinal passage and being configured to permit passage of at least one of:

a cleaning medium to clean said rod and said inner cylinder wall; and

a cooling medium to cool said cylinder and said rod; and

a lubricating medium to lubricate said rod and said inner cylinder wall;

said first longitudinal passage comprising an inlet;

said second longitudinal passage comprising an inlet;

a fitting being configured and disposed to connect said inlet of said first longitudinal passage to a source of pressure medium and also to connect said inlet of said second longitudinal passage to a source of at least one of:

a cleaning medium; and

a cooling medium; and

a lubricating medium;

at least one passage configured to connect said second longitudinal passage to said exterior of said rod and to said

interior of said cylinder for the supply of at least one of:

- a cleaning medium; and
- a cooling medium; and
- a lubricating medium;

into said cylinder;

said filling machine further comprising:

a first valving arrangement being configured and disposed to introduce a pressure medium through said fitting, and through said first longitudinal passage, and into said cylinder;

a second valving arrangement being configured and disposed to introduce at least one of:

- a cleaning medium; and
- a cooling medium; and
- a lubricating medium;

through said fitting, and through said second longitudinal passage and said connecting passage, and into said cylinder; and

a control arrangement being configured and disposed to control introduction of a pressure medium into said cylinder during operating cycles of said filling machine and to control introduction of at least one of:

- a cleaning medium; and
- a cooling medium; and
- a lubricating medium;

into said cylinder during servicing cycles of said filling machine.

2. The beverage bottling plant according to claim 1, wherein:
said control arrangement is configured to provide automatically control to terminate filling of containers and to initiate cleaning of said filling machine and said lifting device.

3. The beverage bottling plant according to claim 2 comprising all of (a), (b), (c), (d), (e), (f), (g), (h), (i), and (j), wherein (a), (b), (c), (d), (e), (f), (g), (h), (i), and (j) comprise:

(a) said control arrangement comprises a data processor;
said data processor comprises a programmed control apparatus for determining of periods of time of filling of containers and of periods of time of cleaning of said filling machine and said lifting device;

(b) said control arrangement is programmed to control the pressure and the volume of a cleaning medium introduced by said second valving arrangement;

(c) said at least one second longitudinal passage is disposed adjacent said first longitudinal passage; and

said second longitudinal passage is configured and disposed to permit introduction into said cylinder of at least one of:

a disinfecting medium; and

a lubricating liquid;

(d) said rod comprises a seal arrangement disposed between said rod and said cylinder;

said connecting passage is disposed adjacent said seal arrangement;

(e) said second valving arrangement comprises a conduit

configured and disposed to permit passage of a disinfecting medium;
said second longitudinal passage is connected to said conduit
for a disinfecting medium;

(f) said second valving arrangement comprises another conduit
configured and disposed to permit passage of at least one of:

a lubricating liquid; and

a cooling liquid;

and

said second longitudinal passage is connected to said another
conduit to receive at least one of:

a lubricating liquid; and

a cooling liquid;

(g) said second valving arrangement comprises a distributor
arrangement having at least one rotary part to permit distribution of at
least one of:

a disinfecting medium;

a lubricating liquid; and

a cooling liquid;

said rotary distributor arrangement is operatively connected to
said filling machine at a stationary part of said filling machine;

(h) said first valving arrangement and said second valving
arrangement are connected to said first longitudinal passage and said
second longitudinal passage by an arrangement that comprises a
fitting and a seal;

(i) said first longitudinal passage is configured to permit passage
of compressed air into said cylinder to raise said cylinder and a
container supported by said cylinder; and

(j) said connecting passage is configured to deliver a spray of cleaning medium onto said outer surface of said rod.

4. A method for operating an arrangement for operating and servicing a lifting device of a container filling machine in a plant for filling containers with a liquid beverage, said arrangement comprising:

a first valving arrangement being configured and disposed to introduce a pressure medium into said lifting device and to release a pressure medium from said lifting device to raise and lower said lifting device in said filling machine for filling of containers;

a second valving arrangement being configured and disposed to introduce at least one of:

a cleaning medium; and

a lubricating medium;

into said lifting device;

and

a control arrangement being configured and disposed to control introduction of a pressure medium into said lifting device during filling of containers, and to control introduction of at least one of:

a cleaning medium; and

a lubricating medium;

into said lifting device;

said method comprising the steps of:

controlling opening of said first valving arrangement to introduce a pressure medium into said lifting device and to release a pressure medium from said lifting device to raise and lower said lifting device in said filling machine during filling of containers;

introducing a pressure medium into said lifting device to raise said lifting device during filling of containers;

releasing a pressure medium from said lifting device to lower said lifting device during filling of containers;

controlling opening of said second valving arrangement to introduce at least one of:

a cleaning medium; and

a lubricating medium;

into said lifting device;

and also controlling at least one of (a) and (b), wherein (a) and (b) comprise:

(a) introducing a cleaning medium into said lifting device to clean said lifting device; and

(b) introducing a lubricating medium into said lifting device to lubricate said lifting device.

5. The method according to claim 4, wherein:

said control arrangement is configured to provide automatically control to terminate filling of containers and to initiate cleaning of said filling machine and said lifting device;

and comprising the steps of:

issuing a signal to terminate filling of containers; and

issuing a signal to initiate cleaning of said filling machine and said lifting device.

6. The method according to claim 5 comprising all of: (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), and (l), wherein (a), (b), (c), (d),

(e), (f), (g), (h), (i), (j), (k), and (l) comprise:

(a) said control arrangement comprises a data processor;
said data processor comprises a programmed control
apparatus for determining of periods of time of filling of
containers and of periods of time of cleaning of said filling
machine and said lifting device;
and comprising the steps of:

determining a period of time of filling of containers; and
determining a period of time of cleaning of said filling
machine and said lifting device;

(b) said control arrangement is programmed to control the
pressure and the volume of a cleaning medium introduced by said
second valving arrangement,

and comprising the step of:

controlling the pressure and the volume of a cleaning
medium introduced by said second valving arrangement;

(c) said lifting device comprises a cylinder having an interior
cylinder wall;

said first valving arrangement is configured to introduce a
pressure medium into said cylinder during filling of containers; and

said second valving arrangement is configured to perform at
least one of: (i), (ii), (iii), wherein (i), (ii), and (iii) comprise:

(i) to introduce a cleaning medium to clean said lifting
device;

(ii) to introduce a cleaning medium to clean said interior
cylinder wall; and

(iii) to introduce a lubricating medium to lubricate said

interior cylinder wall;

and comprising the steps of:

introducing a pressure medium into said cylinder during filling of containers;

introducing a cleaning medium to clean said lifting device during a period of cleaning;

introducing a cleaning medium to clean said interior cylinder wall during a period of time of cleaning of said filling machine; and

introducing a lubricating medium to lubricate said interior cylinder wall during a period of time of filling containers;

(d) said lifting device comprises a rod having a first longitudinal passage for introduction of a pressure medium into said cylinder and having at least one second longitudinal passage disposed adjacent said first longitudinal passage;

said second longitudinal passage is configured and disposed to permit introduction into said cylinder of at least one of:

a disinfecting medium; and

a lubricating liquid;

and comprising the steps of:

introducing a pressure medium through said first longitudinal passage into said cylinder; and

introducing through said second longitudinal passage into said cylinder of at least one of:

a disinfecting medium; and

a lubricating liquid;

(e) said rod comprises a outer surface and a passage configured

and disposed to connect said second longitudinal passage with said outer surface of said rod;

and comprising the step of:

introducing through said connecting passage into said cylinder of at least one of:

a disinfecting medium; and

a lubricating liquid;

(f) said rod comprises a seal arrangement disposed between said rod and said cylinder;

said connecting passage is disposed adjacent said seal arrangement;

(g) said second valving arrangement comprises a conduit configured and disposed to permit passage of a disinfecting medium;

said second longitudinal passage is connected to said conduit for a disinfecting medium; and comprising the step of:

passing a disinfecting medium through said conduit and through said second longitudinal passage;

(h) said second valving arrangement comprises another conduit configured and disposed to permit passage of at least one of:

a lubricating liquid; and

a cooling liquid;

and

said second longitudinal passage is connected to said another conduit to receive at least one of:

a lubricating liquid; and

a cooling liquid;

and comprising the step of:

passing at least one of:

- a lubricating liquid; and
- a cooling liquid;

through said another conduit and through said second longitudinal passage;

(i) said second valving arrangement comprises a distributor arrangement having at least one rotary part to permit distribution of at least one of:

- a disinfecting medium;
- a lubricating liquid; and
- a cooling liquid;

said rotary distributor arrangement is operatively connected to said filling machine at a stationary part of said filling machine; and comprising the step of:

selecting at least one of:

- a disinfecting medium;
- a lubricating liquid; and
- a cooling liquid;

for passing through said second longitudinal passage;

(j) said first valving arrangement and said second valving arrangement are connected to said first longitudinal passage and said second longitudinal passage by an arrangement that comprises a fitting and a seal;

(k) said first longitudinal passage is configured to permit passage of compressed air into said cylinder to raise said cylinder and a container supported by said cylinder;

and comprising the step of:

passing compressed air into said cylinder to raise said cylinder and a container supported by said cylinder;
and

(l) said connecting passage is configured to deliver a spray of cleaning medium onto said outer surface of said rod;
and comprising the step of:

spraying a cleaning medium onto said outer surface of said rod during a period of time of cleaning said filling machine.

7. An arrangement for operating and servicing a lifting device of a container filling machine in a plant for filling containers with a liquid beverage, said arrangement comprising:

a first valving arrangement being configured and disposed to introduce a pressure medium into said lifting device and to release a pressure medium from said lifting device to raise and lower said lifting device in said filling machine for filling of containers;

a second valving arrangement being configured and disposed to introduce at least one of:

a cleaning medium; and
a lubricating medium;

into said lifting device;

and

a control arrangement being configured and disposed to control introduction of a pressure medium into said lifting device during filling of containers, and to control introduction of at least one of:

a cleaning medium; and
a lubricating medium;

into said lifting device.

8. The arrangement according to claim 7, wherein:
said control arrangement is configured to provide automatically control to terminate filling of containers and to initiate cleaning of said filling machine and said lifting device.

9. The arrangement according to claim 8, wherein;
said control arrangement comprises a data processor;
said data processor comprises a programmed control apparatus for determining of periods of time of filling of containers and of periods of time of cleaning of said filling machine and said lifting device.

10. The arrangement according to claim 9, wherein;
said control arrangement is programmed to control the pressure and the volume of a cleaning medium introduced by said second valving arrangement.

11. The arrangement according to claim 10, wherein:
said lifting device comprises a cylinder having an interior cylinder wall;
said first valving arrangement is configured to introduce a pressure medium into said cylinder during filling of containers; and
said second valving arrangement is configured to perform at

least one of: (a), (b), (c), wherein (a), (b), and (c) comprise:

(a) to introduce a cleaning medium to clean said lifting device;

(b) to introduce a cleaning medium to clean said interior cylinder wall; and

(c) to introduce a lubricating medium to lubricate said interior cylinder wall.

12. The arrangement according to claim 11, wherein:

said lifting device comprises a rod having a first longitudinal passage for a pressure medium and at least one second longitudinal passage disposed adjacent said first longitudinal passage;

said second longitudinal passage is configured and disposed to permit introduction into said cylinder of at least one of:

a disinfecting medium; and

a lubricating liquid.

13. The arrangement according to claim 12, wherein:

said rod comprises an outer surface and a passage configured and disposed to connect said second longitudinal passage with said outer surface of said rod.

14. The arrangement according to claim 13, wherein:

said rod comprises a seal arrangement disposed between said rod and said cylinder;

said connecting passage is disposed adjacent said seal arrangement.

15. The arrangement according to claim 14, wherein:
said second valving arrangement comprises a conduit configured and disposed to permit passage of a disinfecting medium;
said second longitudinal passage is connected to said conduit for a disinfecting medium.

16. The arrangement according to claim 15, wherein:
said second valving arrangement comprises another conduit configured and disposed to permit passage of at least one of:
a lubricating liquid; and
a cooling liquid;
and
said second longitudinal passage is connected to said another conduit to receive at least one of:
a lubricating liquid; and
a cooling liquid.

17. The arrangement according to claim 16, wherein:
said second valving arrangement comprises a distributor arrangement having at least one rotary part to permit distribution of at least one of:
a disinfecting medium;
a lubricating liquid; and
a cooling liquid;
said rotary distributor arrangement is operatively connected to said filling machine at a stationary part of said filling machine.

18. The arrangement according to claim 17, wherein:
said first valving arrangement and said second valving arrangement are connected to said first longitudinal passage and said second longitudinal passage by an arrangement that comprises a fitting and a seal.

19. The arrangement according to claim 18, wherein:
said first longitudinal passage is configured to permit passage of compressed air into said cylinder to raise said cylinder and a container supported by said cylinder.

20. The arrangement according to claim 19, wherein:
said connecting passage is configured to deliver a spray of cleaning medium onto said outer surface of said rod.